CLAIMS AS AMENDED UNDER PCT ARTICLE 19

1. A semiconductor device comprising a semiconductor substrate (1) having a predetermined concentration Ns of a dopant of a first conductivity type, source (2) and drain (3) regions which are doped with a dopant of a second conductivity type; the opposite of the first, and define, in the substrate, junctions (4, 5) delimiting a channel region (6) of predetermined nominal length L_N and, in the channel region (6), a first pocket (7, 8) adjacent to each of the junctions (4, 5) and having a predetermined length Lp, said first pockets (7, 8) being doped with a dopant of the first conductivity type of concentration Np locally increasing the net concentration in the substrate above Ns, characterized in that it comprises, in the channel region (6), at least one second pocket (9, 10) adjacent to each of the junctions (4, 5) and stacked against each of the first pockets (7, 8), said second pockets (9, 10) having a length Ln such that Ln > Lp and being doped with a dopant of the second conductivity type with a concentration Nn such that Nn < Np and locally decreasing the net concentration of the substrate but without changing the conductivity type, and in that the concentration Nn of dopant of the second conductivity type in the second pockets satisfies the relationship Nn < Ns, the overall length of the first and second pockets being less than the nominal length L_N of the channel region.

2. The semiconductor device as claimed in claim 1, characterized in that the second pockets (9, 10) comprise a plurality of elementary pockets stacked against one another, each elementary pocket of a given rank i having a predetermined length Ln_i and a predetermined concentration Nn_i of a dopant of the second conductivity type satisfyingthe relationships:

$Ln_i > Lp$

$Ln_{i-1} < Ln_i < Ln_{i+1}$,

$Nn_{i-1} > Nn_i > Nn_{i+1}$, and

the sum ΣNn_i of the concentrations of the dopant of the second conductivity type in the elementary pockets of the plurality satisfying the relationship $\Sigma Nn_i < Ns$.

3. The device as claimed in claim 1 or 2, characterized in that the device is an MOS transistor.

4. A process for fabricating a semiconductor device as claimed in claim 1 or 2, comprising:

- the formation, in a semiconductor substrate (1) having a predetermined concentration Ns of a dopant of the first conductivity type, of a source region (2) and of a drain region (3) which are doped with a dopant of a second conductivity type, the opposite of the first, said source and drain regions forming, in the substrate, junctions (4, 5) delimiting between them a channel region (6) having a predetermined nominal length L_N, and

- the formation, in the channel region (6) in a zone adjacent to each of the junctions (4, 5), of a first pocket (7, 8) having a predetermined length Lp and a predetermined concentration Np of a dopant of the first conductivity type locally increasing the net concentration in the substrate above Ns;

characterized in that it furthermore comprises:

- the implantation, in the channel region (6), of a dopant of the second conductivity type, the opposite of the first, under conditions such that at least one second pocket (9, 10) is formed in the channel region (6), this second pocket being stacked against each of the first pockets (7, 8) respectively, and having a length Ln such that Ln > Lp and a concentration Nn of a dopant of the first type such that Nn < Np and locally decreasing the net concentration in the substrate, but without changing the conductivity type, and in that concentration Nn of dopant of the second conductivity type in the second pockets satisfies the relationship Nn < Ns, the overall length of the first and second pockets being less than the nominal length L_N of the channel region.

5. The process as claimed in claim 4, characterized in that the implantation of the dopant of the second conductivity type consists of a series of successive implantations such that the second pockets (9, 10) each consist of a plurality of stacked elementary pockets, each elementary pocket of a given rank i having a length Ln_i and a concentration Nn_i of a dopant of the second conductivity type satisfying the relationships:

$Ln_1 > Lp$

$Ln_{i-1} < Ln_i < Ln_{i+1}$

$Nn_{i-1} > Nn_i > Nn_{i+1}$ and

the sum ΣNn_i of the concentrations of the dopant of the second conductivity type in the plurality of elementary pockets satisfying the relationship $\Sigma Nn_i < Ns$.

6. The process as claimed in claim 4 or 5, characterized in that the implantation conditions include the implantation angle of incidence with respect to the normal to the substrate, the implantation dose and the implantation energy.

7. The, process as claimed in claim 5, characterized in that, in the series of successive implantations, the angle of incidence with respect to the normal is increased and the implantation dose is decreased from one successive implantation to another.

8. The process as claimed in claim 5, characterized in that the series of successive implantations consists of implanting the dopant of the second conductivity type using the same angle of incidence with respect to the normal to the substrate, the same implantation dose and the same implantation energy, and, between each successive implantation, in subjecting the device to a different annealing treatment.

add A'